Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Reallocation of the 216-220 MHz,	)	ET Docket No. 00-221
1390-1395 MHz, 1427-1429 MHz,	)	RM-9267
1429-1432 MHz, 1432-1435 MHz,	)	RM-9692
1670-1675 MHz, and 2385-2390 MHz	)	RM-9797
Government Transfer Bands	)	RM-9854

To: The Commission

COMMENTS OF REVELATION L.L.C.

Revelation L.L.C. ("Revelation"), pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, hereby files its Comments in response to the *Notice of Proposed Rule Making* in the above-captioned proceeding.[1] Specifically, in response to the Commission's request for comments on allocations to be made for these frequency bands, Revelation believes that the Commission would advance the public interest by allocating 1 MHz of spectrum for advanced radio frequency identification ("RFID") services in 1390-1395 MHz band, or alternatively by allocating a total of 1 MHz taken from the 1390-1395 MHz and 1427-1435 MHz bands.

I. Advanced RFID Technology Would Provide Numerous Public Benefits.

Revelation has developed an innovative technology for conducting advanced RFID operations. While traditional RFID consists of short-range, low power ID code reading, Revelation's

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[1] *In the Matter of Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, ET Docket No. 00-221, *Notice of Proposed Rule Making*, FCC 00-395 (Nov. 20, 2000) ("*NPRM*").

advanced RFID equipment has the ability to detect, identify, sort, count, locate, operate and electronically secure various objects. Revelation's technology is further distinguished from other traditional RFID methods by its ability (1) to accomplish all of these functions in a relatively faster and more cost-effective manner, and (2) to be used on large quantities of items, located in large volumes of space, and over long distances.

Specifically, Revelation's advanced RFID system would consist of multiple temporary fixed base stations ("interrogators") and fixed and mobile transponders ("tags"). The tags would be affixed to various articles, such as inventory, vehicles, persons, valuables, animals, hazardous materials, *etc.* The interrogators would transmit a signal designed to be received by the tags. The tags would not have separate power supplies or transmitters, but rather would reflect the signal at low power levels back to the interrogator at the same frequency, along with information stored in the tag.

Revelation's advanced RFID technology has the potential to bring substantial benefits to the general public, industry and government in an extremely cost-effective manner. Potential applications include:

- detecting misdirected airplanes and other vehicles on runways and alerting air traffic control;
- recognizing persons entering restricted areas;
- detecting and sorting airplane parts based on FAA approval for installation;
- allowing firefighters to identify hazardous materials before entering burning buildings;
- controlling medical supplies in hospital environments;
- conducting inventory of substantial quantities of items in a large warehouse;
- locating specific objects over large industrial campuses;
- locating persons who may be in hazardous areas;
- operating gates, doors, toll booths, medicine dispensers, *etc.*, for certain individuals; and
- detecting unauthorized movement or theft of tagged articles, including intellectual properties.

The Revelation system has almost endless potential applications, and the ability to increase personal safety, prevent theft, improve productivity, reduce business and governmental costs, improve accounting accuracy, greatly reduce time for inventory determination, and locate people and objects. Numerous potential customers, including both private firms and governmental agencies, have approached Revelation for its technology and products, recognizing the benefits of enhanced efficiency in obtaining data concerning remote objects. The realization of these benefits will be placed in jeopardy unless the Commission allocates some spectrum in the instant proceeding to advanced RFID services.

II. The Commission Should Allocate 1 MHz of Spectrum for Advanced RFID Services.

As the Commission noted in the *NPRM*, the spectrum being transferred from federal government use will foster a variety of potential applications and enable the development of new technologies and services, despite the constraints and narrow bandwidth of these bands.[2] Advanced RFID services such as Revelation's represent just the kind of new technology that can benefit from the transfer of government spectrum to private sector use. The minimal spectrum allocation required by advanced RFID make it an excellent candidate for this spectrum. As discussed above, Revelation's advanced RFID technology is unique, advanced, and will provide substantial public benefits. Furthermore, other spectrum that would be technically and economically feasible for advanced RFID technologies such as Revelation's is too encumbered with existing uses to permit viable deployments.

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2 *NPRM* at ¶ 1.

Revelation believes that advanced RFID services, offering the many benefits described above, can be successfully deployed with a minimal allocation of only 1 MHz of spectrum. Of the government transfer bands being considered in this proceeding, the most suitable spectrum is in the 1390-1395 MHz and 1427-1435 MHz bands because at frequencies above 1435 MHz, the power, range, and practical antenna efficiencies for unpowered transponders approach a point of impracticality for large volumes of space, with large quantities to be identified. Ideally, the entire 1 MHz block would be allocated in the 1390-1395 MHz band, with a secondary option of splitting the 1 MHz allocation between that band and the 1427-1435 MHz band.[3] Revelation trusts, however, that the Commission will balance the competing interests in this proceeding and determine how best to make this allocation.

The Commission noted in the *NPRM* that "there is insufficient spectrum available to accommodate all of the petitions and requests," and thus invited comment on how to ensure that the spectrum is put to the best use.[4] As an initial matter, it is significant to note that the spectrum requirement for advanced RFID operations is minimal compared with other potential allocations, and that the public benefits to be gained from these operations are relatively great. Using a small sliver of spectrum, advanced RFID operations such as Revelation's can quickly and accurately identify voluminous articles spread across large areas. Revelation's RFID technology employs very low duty cycles and with relatively low output power. The technology therefore lends itself to being able to coexist with other users.

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[3] Splitting the allocation between these two bands would give operators greater flexibility in the event that one of the bands cannot be used for advanced RFID operations in a particular area because of protected federal government and military operations.

[4] *NPRM* at ¶ 30.

Particularly with respect to the 1427-1435 MHz band, Revelation recognizes that the Commission has allocated the 1429-1432 MHz band to the Wireless Medical Telemetry Service,[5] and that the 1427-1429 MHz band is currently used on a secondary basis for utility telemetry. As noted, Revelation would prefer an allocation in the 1390-1395 MHz band but would find it acceptable for a portion of the allocation for advanced RFID services to be in the 1427-1435 MHz band. Furthermore, Revelation has been in contact with representatives of both the American Hospital Association Task Force and Itron, and believes that advanced RFID operations, wireless medical telemetry and utility telemetry may all be able to operate successfully within the same 5 MHz band. Thus, allocating some spectrum for advanced RFID operations within the 8 MHz of spectrum in the 1427-1435 MHz band would not jeopardize spectrum efficiency.

The Commission can serve another important public interest goal by allocating spectrum for advanced RFID services. Specifically, the international community has already undertaken efforts to identify spectrum for advanced RFID services, and to develop an open RFID frequency standard to serve the needs of a global user community. By allocating spectrum as requested herein, the FCC would ensure that the United States takes the lead in establishing spectrum allocations and standards for what is and will continue to be a highly competitive RFID industry. In this manner, U.S. companies like Revelation will become the worldwide leaders in the provision of advanced RFID products and services.

In the *NPRM*, the Commission stated that parties that recommend new services should offer suggestions for service rules in order to assist the Commission with evaluating the viability of such

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[5] *See Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service (WMTS)*, ET Docket No. 99-255, PR Docket No. 92-235, *Report and Order*, FCC 00-211 (rel. June 12, 2000).

new services.[6] Revelation believes that advanced RFID operations should be licensed on a nationwide basis, divided in 20 kHz channel blocks. With respect to technical rules, output power should be limited to 50 watts.

III. Conclusion

For the reasons stated above, the Commission would serve the public interest by allocating 1 MHz of spectrum for advanced RFID operations in 1390-1395 MHz band, or alternatively by allocating a total of 1 MHz taken from the 1390-1395 MHz and 1427-1435 MHz bands.

Respectfully submitted,

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6 *NPRM* at ¶¶ 7, 37.